



THE COMMUNICATOR SURREY AMATEUR RADIO CLUB



Volume II

June 2009

Issue XXXV

VE7SAR

VE7RSC

PRESIDENT - Vacant

VICE PRESIDENT - John Brodie VA7XB

SECRETARY - Gordon Kirk VE7GRK

TREASURER - Vacant

WEB SITE - <http://www3.telus.net/ve7sar/>

WEB MASTER - Hiu Yee VE7XYG

COMMUNICATOR EDITOR - Fred Orsetti

VE7IO

BOARD OF DIRECTORS:

John Schouten - VE7TI

Wayne Muster VE7HM

Fred Orsetti - VE7IO



SARC
Surrey Amateur Radio Club

**ALWAYS MONITOR 147.36+ (110.9)
OR 443.775+ (110.9 in and out) IRLP 1463**

CLUB NET @ 8:00 P.M. Tuesday 147.36+ (110.9)

Thursday 144.250 USB 7:30 P.M.

CLUB MAILING ADDRESS : 239 -7156 121 St. Surrey, B.C. V3W 0J6

The next meeting of the Surrey Amateur Radio Club will be held on Wednesday September 2 2009 at the Provincial Regional Emergency Operations Center (PREOC) located at 14275 96th Avenue Surrey V3T 4M5 - Enter off 96th Talk in on 147.36+ (110.9) 443.775+ (110.9)

Minutes for Jun 3, 2009 SAR Club

Annual General Meeting

1. The meeting was called to order at 7:35 pm June 3, 2009 chaired by Vice-President John VA7XB. 21 members entitled to vote were in attendance at the Surrey PREOC building.

2. Current membership list shows 69 members, quorum is 17.

3. Call to add to the agenda, no further items to add.

4. Motion to adopt the agenda by Hiu VE7YXG. Seconded by Dennis VE7DGH. Motion passed.

5. Motion to adopt the previous minutes by Rob, VE7CZV. Seconded by Kjeld VE7GP. Motion passed (Minutes are posted on the club website and sent out to all members in the "Communicator".

6. Gary VE7AS presented certificates to Egon, Kelvin, Amanda, Sam, Vickie,

Michael, Sharon, Arthur, Nicole, Orin, Allan and Barry for their successful completion of the recent Ham class. Thanks to our Instructors for their hard work.

7. Resolution to adopt the Letter of Understanding (circulated by email to the membership early in May) between SEPARS and SARC as presented. Motion by Rob VE7CZV. Seconded by Gord VE7GRK.

Call to speak for or against was made by John VA7XB. Gary VE7AS asked a question regarding the necessity of this agreement. The answer was to clarify and document the two groups purpose and relationship to each other. Bill Gipps spoke to this.

Motion carried none opposed, unanimous in favor of motion.

8. Financial Report:

Lloyd Hargrove passed away and John VA7XB resumed this duty for the balance of the year as he had previously been the treasurer. In the reconciliation \$20.02 was the required adjustment to balance the books.

The ledger and accounts were reviewed by Don's (VA7GL) wife, Pamela, who is a CGA. The document was verified as correct. For the balance sheet, asset value was set by John VA7XB with his best estimate to the current value of some of the equipment. Only the cash in the accounts is accurate, the equipment list value is a best estimate.

The Income and Expenses are as per the

presented sheet. With 69 members the question was asked why the membership income did not reflect 69 x \$20. The answer is family memberships and students from the ham class and those joining late in the year get up to 1.5 years membership for the price of 1, and the dues may have been paid last year. Decisions on anticipated expenses have been deferred to the new Executive for next year.

Kelvin Hall volunteered to look for a projector for the club.

John VA7XB asked for a motion to accept the financial report as presented. Gary VE7AS moved and Egon Frank seconded, motion carried with no opposition.

9. Venue Changes:

As the current location in the PREOC will go into 2010 "lockdown" mode in the fall we have been looking for another location for meetings. Surrey Parks Nature Centre on the same site is being checked into. As a fallback, Al Nuefeld VE7CDC will allow his company's classrooms at Boundary Bay airport to be used if required.

10. SEPAR Society Report:

Fred VE7IO was absent and no formal report was given. Society name has been approved. Constitution and by-laws are ready for submission to Victoria. Lottery applications are underway. Both SARC and SEPARS are preparing unique yet linked grant applications.

11. Field Day:

Anton VE7SSD reminded the members the date was 3 weeks away. A planning meeting was scheduled for June the 8th. All welcome to attend. Help is needed with the food. A notice was sent to the Province newspaper and Surrey. Councilor Marvin Hunt (Honorary member) will visit again this year. Invitations will be sent out to other dignitaries.

12. Health and Welfare:

Please keep Anton VE7SSD updated if anyone hears of a sick or injured club member.

Silent Keys this year: Norm VE7NDM, Vic VE7CON, and Lloyd VE7JLH.

13 Flea Market:

Wayne VE7HM reported this was held at the end of March and was well attended with \$528.00 profit. A brief discussion on dates occurred. A tentative booking for March 28, 2010 has been made but Wayne will confirm a date after checking into the other clubs programs so as not to conflict or be to close to another flea market. The final date will be announced by Wayne. John VA7XB requested that a notice be put into The Canadian Amateur announcing the date.

14 RAC Report:

Bill Gipps VE7XS, as new RAC Director, has been working with Ed Fraser as he takes over this work. He was recently in Ottawa at the Board meeting. They are working hard to rejuvenate the or-

ganization and he encouraged everyone to join RAC. He is also a member of SARC and encouraged the members to get involved in leadership and move the club forward.

15 Election of Executive and Directors:

The number of directors is arbitrary while the President, Vice President, Secretary and Treasurer are required positions to be filled.

Elected were:

President: Heinz VA7AQ

Vice President: Egon Frank VA7EGO

Secretary: Gordon Kirk VE7GRK

Treasurer: Scott Hawrelak VE7CNR

Directors: Bill Gipps VE7XS, John Schouten VE7TI, Fred Orsetti VE7IO, Anton James VE7SSD, John Brodie VA7XB.

A motion to formalize the slate for the SARC Executive and Directors was made by Bill VE7XS, seconded by Gary VE7AS. Carried unanimously.

16 Club Net and Coffee time:

The informal coffee meet at the ABC restaurant will continue for now. The Net will continue formally until Field Day then informally over the summer resuming in September.

17 New Business:

Rob VE7CZV reminded the club the repeater is "a little lonely" and encouraged the club to use it.

18 Repeater Report:

A Lottery application is in preparation to upgrade SARC's 2m and 440 MHz repeaters, including raising of the antennas at the current site. The 220 MHz project has been deferred temporarily pending further discussion but may be the basis of another application later. In the meantime the Club will be applying for a 220 frequency pair from the Coordination Council.

19 BCARCC Report:

John VA7XB attended the Coordination Council meeting on May 31st in lieu of Fred VE7IO who was out of town. BCARCC has proposed a 440 MHz band plan and is looking for comments. They are also requesting that information on coordinated repeaters be renewed annually. Both SARC repeat-

ers are officially coordinated. A Certificate of Coordination, good for 5 years, is to be issued to all coordinated repeaters. Motion was passed by BCARCC that as official policy an attempt will be made to maintain at least 250 km between high-elevation co-channel repeaters; and repeaters running more than 125 watts would be coordinated, but BCARCC will not attempt to resolve complaints in such cases. A proposal was discussed such that a repeater which is inactive for 3 months will be delisted and a new repeater will be coordinated on the channel in the area. New repeaters will be required to use tone-coded squelch. In view of the controversial nature of this matter, it was tabled for further discussion.

Meeting Adjourned 21:20



Don Hamilton VA7GL

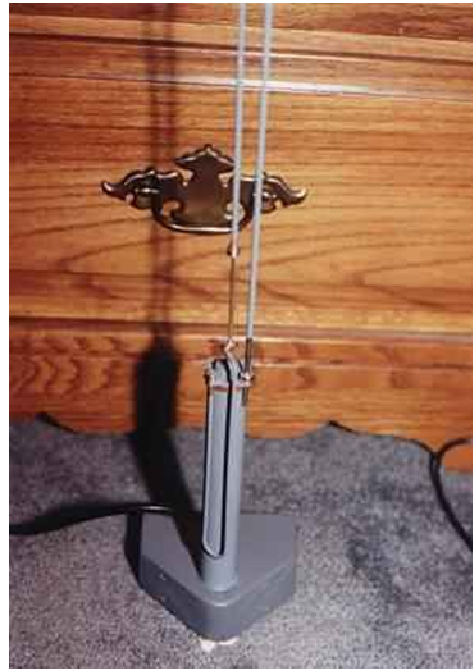
Don has been working hard to get his HF station up and running while trying to find a stealth way to install his screwdriver antenna.

Looks like Don has come up with a very clever way to hide the antenna now if he can just make those DX contacts—Good Luck Don well done.



Some other stealth antennas

Low Profile J Pole up close showing S0-239 mounting and PVC / Wood Base



Low Profile 2 meter J Pole (5/16 copper) built up on SO-239 Panel Connector



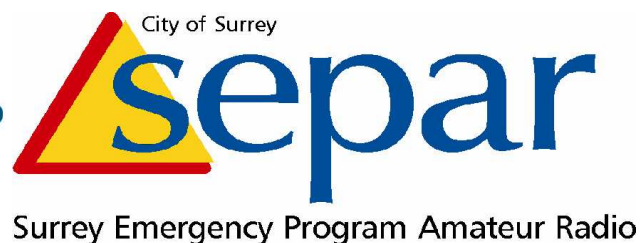
Home Brew 10 thru 30 MHZ Magnetic Loop



SPECIAL FIELD DAY SECTION



**SUPPORT YOUR CLUB AND YOUR
COMMUNITY PARTICIPATE IN FIELD DAY**



CQ Field Day....
Message from John VA7XB
Outgoing Vice President

As most of you know, Field Day is on Saturday June 27th and Sunday June 28th. Here is the plan...

SARC will be operating from Redwood Park which is located on 20th Avenue, 500 metres east of 176th Street (Pacific Highway) in South Surrey. It's a beautiful spot in amongst the tall trees overlooking the valley to the south. The park has a large parking area, a childrens' play area, walking trails and picnic shelters. We will be occupying the upper grassed area which is about the only flat spot in the park.

Setup will begin on Friday around 1400 hr. with the objective to erect the tower, beam, wire antennas and tents. The remaining items including radios will be transported to Redwood Park between 0700 and 0900 hr. Saturday and set up so that all is in readiness by 1100, the start of the event. Assuming we have sufficient operators, contacts will continue through the afternoon and all night. Bands and modes will be selected based on favourable propagation conditions and availability of operators. We expect to operate 3 stations and will have the capability to operate all bands, all modes. The event concludes at 1100 hr. Sunday.

Coffee, water and soft drinks will be available during the entire event. However, please note that you will have to bring your own lunch on Saturday.

Chinese food or pizza will be brought in for supper. Breakfast on Sunday will be eggs, bacon and sausages. There will be a nominal charge to cover the costs of the food. We need to know if you will be present at dinner and breakfast time, so that arrangements can be made to have sufficient food on hand.

Bring a tent or camper if you wish to stay and operate overnight. Surrey Parks will allow a few vehicles to park at the operating site for security. However, vehicles that are not involved in transporting equipment should park in the designated parking lot. Note that consumption of alcohol is not permitted in the park.

Beginners and ham class graduates are especially welcome and will be assisted by more experienced amateurs. Although this is a competition of sorts, it is also an emergency exercise and is meant to be fun. So bring the wife and kids and make it an enjoyable, social event. Dogs must be kept on leash.

We are still short of volunteers, so if you can help with the set up, or take-down, or would like to operate or help with beginners, then please contact Anton James at 604-581-6202 or jamesadf@shaw.ca or Pat Speer ve7pjs@gmail.com and let them know what you can do. We especially need more operators.

WHAT IS FIELD DAY AND WHY DO WE BOTHER

Where the spirit of “Amateur Radio Past” joins forces with the Next Generation of Innovations, Interests and Individuals!!!

ARRL Field Day is the most popular on-the-air operating event in amateur radio. On the fourth full weekend in June, tens of thousands of amateur radio operators gather for a public demonstration of our service. Field Day is part educational event, part operating event, part public relations event – **and ALL about FUN!**

Amateur radio is about knowledge and growth. It is a hobby and service that truly offers “something for everyone.” **Amateur Radio embraces both the old and new.** While CW may no longer be a testing element, it is still a strong and favorite operating mode for many. Tens of thousands of operators are embracing digital technologies, from RTTY to newer digital modes like PSK31 and Olivia. Phone operation, probably the largest segment of the hobby, also has new frontiers to be explored with digitized voice, VOIP, and IRLP. And this is why Field Day – the largest annual on-the-air operating event – is so exciting. It gives all – the old timer and the newcomer, the brass-pounder and the computer assisted operator – the chance to share and teach the broad range of modes and technologies we find in our hobby.

Field Day is truly the time in which we bring amateur radio to Main Street USA/Canada. By setting up in parking lots, malls, Emergency Operations Centers, parks and even at home, amateur operators learn skills that will allow them to better serve their communities. Setting up in these public venues gives added public relations value – their friends and neighbors can see and experience the fun and public service capability that their “ham radio” neighbors bring to the community.

The ARRL/RAC Field Day event is the most attended amateur radio event of the year.

	2007	2006	2005	2004	2003	2002	2001	2000
Total Entries	2331	2199	2212	2241	2080	2110	2062	2054
Novice/GOTA	467	432	396	436	346	428	208	240
Participants	34,833	32,506	33,078	33,002	32,100	34,398	31,530	30,242

CW practice

For those who want to practice their CW here's something that can help.

1. Download and install N1MM contest logging program (it's free)
<http://pages.cthome.net/n1mm/>
2. Download and install MorseRunner (also free) <http://www.dxatlas.com/MorseRunner/>
3. Download and install Autohotkey (also free) <http://www.autohotkey.com/>
4. Go to **AC7FA** website <http://ac7fa.net/?p=81> and follow his instructions make sure you download the MorseRunner—N1MM script from this site and install it into the N1MM folder.
5. Make sure you set up N1MM according to the instruction on the AC7FA website.
6. Start all three programs and “run” MorseRunner you will then be able to log CW contacts in N1MM just like a real contest—it's great fun.

This is the best practice for Field Day that I have found.

We will be using N1MM logging software this year for Field Day so if you download it you will get use to its fundamentals. The main reason for using N1MM this year is its ability to run the radio as well as log the contest.

SARC and SEPAR has requested that the Surrey council declare the week before FD as Amateur Radio Week and we are reasonably sure it will happen, keep an eye open in your community newspaper.

We have posted our field day site on the ARRL Field Day locator you can find this information at <http://www.arrl.org/contests/announcements/fd/locator.php>. You can find SARC and other Field Day sites for 2009

*****NOTE*** Newly licensed hams—here's your chance!**



Q. What is the GOTA station?

- A. It is an opportunity for newly licensed amateurs, other generally inactive licensees, and non-licensed persons to experience first-hand the fun of amateur radio by allowing them to **GET ON THE AIR (GOTA).**

Some tips for operating at Field Day

- 1) You will get many more stations in your log by calling CQ than by tuning the dial and answering CQs; however, if you're calling CQ and not getting any replies, keep calling. Most major contesters call CQ for several minutes at a time before giving up. Giving up after three or four CQs is giving up too soon.
- 2) Keep your CQs short and to the point: "CQ Field Day, CQ Field Day, Whiskey-One-Alfa-Whiskey, Field Day." Wait about 5 seconds between CQs -- this gives stations enough time to answer you.
- 3) Use standard phonetics. "Cute" phonetics don't always get through and they can confuse newer operators.
- 4) When working a station, you should give your exchange information only once and keep it simple. "Whiskey-One-Alfa-Whiskey, copy three Foxtrot Connecticut, QSL?" If they didn't get all of the exchange, they will ask for a repeat.
- 5) If you are running a pileup: Once you have pulled a call out of the pileup, give your exchange information first. Here's an example: "Whiskey-One-Alfa-Whiskey, copy 3F Connecticut, QSL?" Don't ask for the calling station's information first -- this will reduce any sense of rhythm and timing in the pileup.
- 6) If you get a pileup of stations and can't make out an entire call, listen for one letter and ask for it specifically: "The station with Delta only, go ahead."
- 7) When you get the other station's information, keep your acknowledgment simple. "QSL, thanks, QRZ Field Day from Whiskey-One-Alfa-Whiskey."
- 8) Find a comfortable pace for you and maintain that pace. You will tire quickly if you are screaming into the microphone or trying to work stations too quickly. This leads to inefficiency.
- 9) Use a headset with a boom microphone and a foot switch -- this frees up your hands to log QSOs. Writing or typing with a mike in your hand slows you down.
- 10) Go for as many bonus points as you possibly can. Numerous opportunities exist, from copying the Field Day message to sending traffic to using natural power for QSOs. These tips should help maximize your score on Field Day. Remember: No matter how you choose to enjoy Field Day, maximize your fun, however you define it.

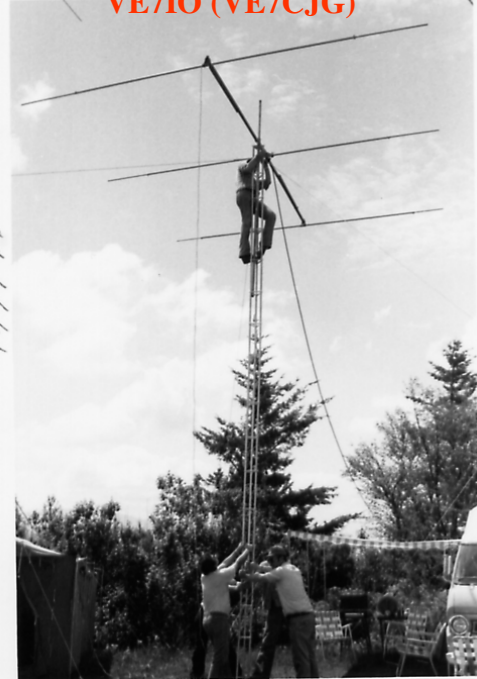
Field Day Nostalgia from 1979 and 1983

SARC FD

VE7BJ SK



VE7IO (VE7CJG)



VE7CFC and VE7CBM both SK



VE7CFC SK and VE7CSJ (VA7ET)



TapeTenna Transmogrification!

With Gary W. Skett, VE7AS

The Ultimate Hidden Antenna HF to UHF Amateur Radio Antennas for Invisible, Portable and Mobile Applications

While antennas are essential to the successful transmission and reception of radio waves, many amateur radio operators are living in places where visible antennas of any description are prohibited by covenant rules and/or by property owners. Some hams that are faced with this dilemma become frustrated by the challenge and resign themselves to “radio inactivity.”

It is this very situation, that making antennas out of ½” copper tape will become your only chance at a viable antenna system, and have the opportunity to make friends over the air!

Just so I don’t have to keep typing “antennas out of ½” copper tape,” I shall hence forth call this your “TapeTenna”. [I just got ‘the look’ with rolling eyes from the YF....]

You can purchase a 54’ roll from Digikey of this super conductive copper foil tape for about \$25USD. You’ll need at least 3 rolls for an 80 metre dipole. There used to be 108’ rolls available, and maybe with a bit of Googling you might find a good Canadian 3M source for the tape. This ½” wide tape and the adhesive are strong and durable and will adhere to most household surfaces indoors or out. The tape is easily soldered.

Most stealth antennas of most any description including verticals, dipoles, quads, yagis, j-poles, etc. for VHF, UHF, and HF, are constructed quickly and easily. Upon completion of assembly and testing of an antenna, (on a wall, a ceiling or a rafter for example) one may paint over the antenna rendering it virtually invisible to the untrained eye.

If you are an experienced antenna builder you may find much of the information in this article to be elementary and may wish to skip over it and proceed with using TapeTenna to build antennas of your own design. I urge you to use your imagination to create new ways to hide effective antennas. I look forward to hearing of your successes.

If you lack experience in antenna design and construction, you will find sufficient information in this article to construct hidden antennas for both indoor and outdoor use.

If you are unable to utilize any of the suggested designs in this article, or if you wish to explore other antenna types, I recommend that you obtain a reliable antenna construction book, such as the [ARRL Antenna Book](#), or the [ARRL Antenna Compendium](#), or something from the [RSGB](#). You may then convert any number of antenna designs to stealth antennas by simply substituting the conductive tape for wire or aluminum elements as specified in the aforementioned texts.

Let’s begin....

Tape Specs

Tape: Aggressive non-corrosive acrylic adhesive, highly conformable electrolytic copper foil.

Wire Equivalent:	#9 America Wire Gauge
Insulation Class:	155°C/311°F
Backing Material:	Electrolytic Copper Foil
Color:	Bright Copper (for a little while....)
Paintable:	Yes
Adhesive:	Acrylic/Thermosetting
Total Thickness:	3.5 Mil.
Tensile Strength:	36 lbs./inch
Length / Roll (std):	54' (from Digikey) 3M may have larger rolls. (They used to sell 100' rolls)
Width (std):	½"

Antenna Basics

An antenna, also called an aerial by the British and some Canadians, is that portion, usually wires or rods, of a radio transmitter or receiver station used for radiating waves into or receiving them from space. Under relatively difficult reception conditions, such as those created by location, terrain, obstructions, covenants, legal restrictions, etc., an antenna becomes critical and should be one especially designed for its intended purpose.

Your TapeTenna will be designed by *you* for *your* specific situation and purpose. It is not the intent of this article to discuss antenna theory; however I do recommend a review of basic antenna theory as presented in various amateur radio publications.

Your antenna is by far the most important element of a radio station. A high quality transceiver coupled to a poor antenna generally will not perform as well as a low quality transceiver coupled to high quality antenna.

Efficiency or Effectiveness

Effectiveness of an antenna, or of anything else, is a measure of how well it does for its intended purpose. For an antenna this means that, when supplied with a reasonable amount of RF power, will consistently produce those contacts you have a reasonable expectation of making. This is a purely subjective property; no numerical value can be assigned to it. Nevertheless, for the radio amateur, the effectiveness of an antenna is its most important property.

Efficiency on the other hand, is a measurable numerical property. Applied to an antenna, efficiency is defined as the watts radiated by the antenna divided by the output (in watts) supplied by the transmitter to the antenna's feed point. Multiplying this figure by 100 gives us the antenna's "percentage efficiency" some of the factors that make up efficiency are theoretical gain, height above ground, ground conductivity, location, terrain, obstructions, etc.

In "real life" situations for the average amateur, *effectiveness* is the first priority and increasing your *efficiency* is an admirable goal.

What are your radio operating expectations? If your expectations are reasonable and your antenna is filling those expectations, then your antenna is effective – whatever its actual numerical efficiency may be. Low diploes amid city buildings, vertical wires surrounded by trees, miniature indoor loops, bedsprings, etc. However inefficient they may be, however offensive to the theoretical purist, such antennas can scarcely be called ineffective.

The fact that relatively inefficient antennas will work is, nevertheless, no justification for sloppiness. It should always be a matter of pride to have the most appropriate antenna you can.

With your TapeTenna and some ingenuity, you will be constructing antennas which are effective and efficient!

Do Indoor TapeTenna's Work?

In a word, yes! In fact, short of going to court, an indoor antenna is often the only solution for some amateurs.

Antenna losses incurred from such materials as wood, brick and roofing normally fall in a range of 1% to 8%, with 2% or 3% being the norm. An exception is structures made of metal such as mobile homes or manufactured homes which may be thermally insulated with a thin sheet of highly conductive aluminum. These two situations can attenuate RF completely. You can easily determine if your home has this type of insulation by using a short wave receiver with a short whip antenna, listen for short wave stations outside the wall and make a note of signal strengths. Listen for the same stations inside the wall. If the signal strength is greatly attenuated or disappears completely when you are indoors, you probably have metallic sheet insulation and it is not advisable to pursue an indoor antenna unless you have access to an attic. Yes, **an attic is the most desirable indoor antenna location!**

Disadvantages of indoor antennas

- 1) Horizontal antennas may be low to the ground if on the first floor (rule is high horizontal and low vertical).
- 2) Some attenuation from building materials.
- 3) The closer proximity to electrically conductive objects such as power and phone wiring, heating ducts and pipes or rain gutters, into which a passing radio wave will induce currents to flow. These will not only absorb some energy, but will distort the normal field radiation pattern of an indoor antenna. RF interference can be a problem on both receive and/or transmit.

Advantages of indoor antennas

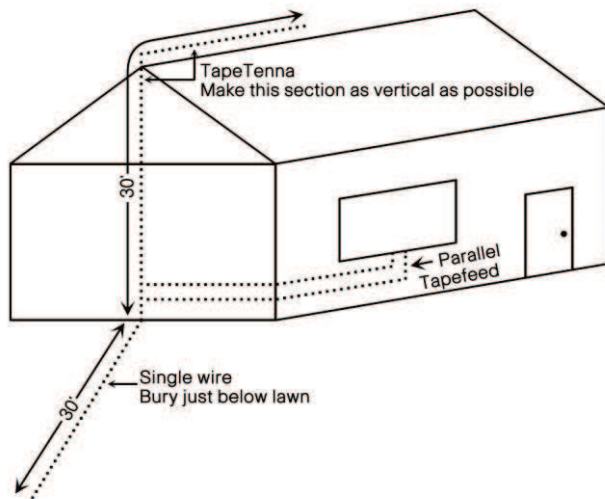
With due consideration to all of the above, an indoor antenna still works. No one would argue that an outdoor site is better if it is possible, but if not, build an *effective* indoor TapeTenna and start having fun!

- 1) Indoor antennas are invisible to outsiders
- 2) They are protected from adverse weather
- 3) They are easier to construct and attach
- 4) They don't really need weather proofing or special treatments or much maintenance.

Attic TapeTennas

If your attic is accessible to you, this is beyond doubt the most desirable location for an indoor antenna, being the highest point in most houses, the radiation efficiency should normally be at its best there, particularly for a horizontal wire. In many attics there is sufficient room to stretch a considerable section of a dipole along the ridge pole (highest horizontal timber of the roof), bending down the ends if necessary. If you can arrange to feed it in the electrical centre with a 2 wire, tuned transmission line, and use a good antenna tuner, there is no need to make the antenna itself of any exact length. If it is at least one-third wavelength long, it will radiate almost as effectively as would a half-wave dipole in the same location. The same antenna will continue to be of use on several different amateur bands. In fact, where it is one-quarter wavelength or more, it will continue to radiate to a considerable degree. A good tuner on the other end of the line will tune it to your operating frequency effectively. Your TapeTenna will adhere to most of your attic materials. Don't be afraid to run it up and down rafters as necessary to achieve a good secure bond. If you will be using less than 30 watts, you may use ordinary TV twin lead as a feed line without serious loss! **(Do not exceed 30 watts on TV line for safety).**

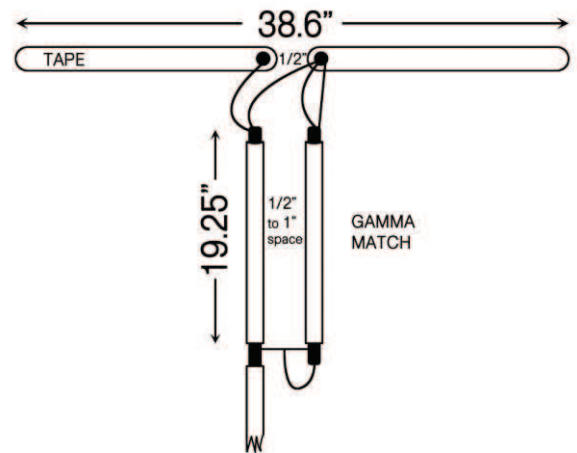
Snake the line down to the shack's antenna tuner via the most convenient path but try to keep the line as much at right angles to the TapeTenna as possible.



difficulty working stations coast to coast with this antenna at the lowest year of the solar cycle!!

Mind you....today's antenna tuners don't have connections for anything other than coax cable....so design your antennas accordingly.

Attic dipoles are not the only form of attic transmitting antennas. TapeTenna loops of various configurations are also practical and can be quite effective; see the various antenna articles for ideas here. A simple long wire, bent around inside the attic, has often been used with good success. Look into the antenna books and use your imagination. There are numerous possibilities... but if you cannot get to your attic, downstairs indoor antennas will work, even if they are more of a challenge. I've tested a no frills indoor looped dipole, at about 8' above ground. I had no



Tuners, Baluns, and Accessories

The main use of an antenna tuner is to enable one to use a TapeTenna system of random or electrically unknown properties. With an effective tuner, almost any length of TapeTenna may be resonated and may radiate remarkably well.

If you plan to use a single band resonant TapeTenna, you may, with careful pruning and trimming, get by without the use of a tuner, however I recommend its use for its broad banded benefits as well as its harmonic suppression attributes. For all non-resonate TapeTenna's (those not cut to a specific frequency), you will need a tuner. If you choose a commercially made tuner, I recommend one with a 4 to 1 balun built in. If you already have a tuner without a balun, you may purchase [or make] an external balun. External 4 to 1 baluns are relatively inexpensive and are simply placed in line between your tuner and your balanced (parallel conductor) feed line. If you are so inclined, you may build a suitable tuner. Three basic types of tuners are PI network, C-L-C Tee, and SPC (Series-Parallel capacitance).

Working with Copper Tape

Whether indoors or outdoors, the surface to which you will apply tape should be clean and free of dirt or wax. If your TapeTenna is to be a specific length, be sure to measure the surface to insure that you have enough linear length for your TapeTenna. You may cut the tape with shears, knives, or razor blades.

For resonant TapeTenna's, it is advisable to cut the tape to about 5% longer than the formula length. This will allow for trial and error pruning to the resonant length. With the unknown influences of surrounding objects, such trimming will probably be necessary. It is always easier to trim tape than it is to add more tape to achieve resonance.

Try to avoid seating tape in close proximity to metal objects, but if you must bridge metal objects, such as rain gutter for example, find a suitable material to insulate the tape from the metal. Do not allow the tape to make electrical contact with the metal, and space the tape as far from the metal as is practical.

If you must run the tape at a 90 degree angle to itself (with respect to the surface of the tape) I recommend cutting, splicing, and soldering [with care].

Alternate method – no soldering – use alligator clips, or thumb tacks, or even staples work....for a while...

Feed point Wiring: One may choose to have a feed line which can be removed easily to minimize the visual impact with indoor antennas. In this case, use alligator clips to terminate your coax or twin lead, then simply clip the feed line to the tape when you want to use the antenna. It is advisable to relieve the stress on the TapeTenna by wrapping the feed line around an adjacent object to support the weight of the line.

Where possible, a more permanent feed point connection is advised. I recommend soldering the feed line directly to TapeTenna. For outdoor installations, you may protect your feed point wiring with duck seal with is available at electrical supply houses.

You may hide your TapeTenna from view by simply painting it to match the colour of the material to which it is applied. When used over drywall, it can be completely hidden by applying joint compound as you would over drywall tape, then paint to match the wall. Removing the tape will, in 98% of the cases, take off whatever it's stuck to...so consider this a permanent installation!

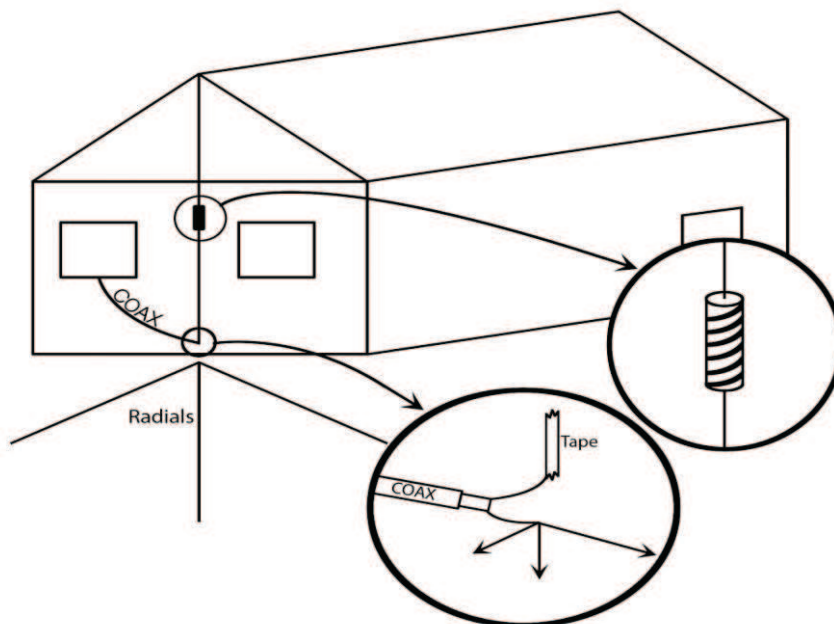
Working with the Tape Feed lines and Tape Coil

Discrete and stealth antennas are one of the excellent assets of copper tape. In addition to hidden antennas, you will also be able to create hidden balanced feed lines! Two parallel strips of ½" tape, spaced 2" apart makes 400 ohm balanced feed line! You may now camouflage the feed line by painting it. ***Now you have hidden both the feed line and the antenna!***

Make a twin lead jumper to go between your tape feed and your antenna tuner.

Tape Coil: You may wind your own loading coils and traps with tape. One may wish to fit a vertical or horizontal resonant TapeTenna into a place which is electrically too short for the desired frequency. To achieve this you can place a loading coil in line with the antenna. This is the method by which mobile HF is possible with short vertical antennas.

For example, to make a vertical TapeTenna on the end of a house, helically wind tape around any suitable non-conductive dielectric coil form such as PVC pipe, paper spools, etc., then place the coil in line with a run of tape extending from the peak of the house to the ground. Use a grid dip meter to find the resonant frequency which exists and then add or remove coil windings until you achieve resonance at your desired frequency. You will be adding coil turns to lower the frequency and removing turns to raise it. Now bury 2, 3, 4 or more quarter wavelengths wires (radials), extending them away from the vertical tape. Solder the center conductor of your 52 ohm coax to the base of the TapeTenna. Now connect all of your radials together with the coax braid and solder them together. Now paint the antenna and coil.



Invisible, Mobile, and Portable TapeTennas

The following suggestions for possible antennas are by no means comprehensive. Create your own antennas and have fun!

#1 – Five Band Inverted Vee

Type: Inverted Vee

Bands: 20, 17, 15, 12, and 10 meters. Antenna tuner not required.

Feed line: 52 ohm coax

Make each leg of dipole:

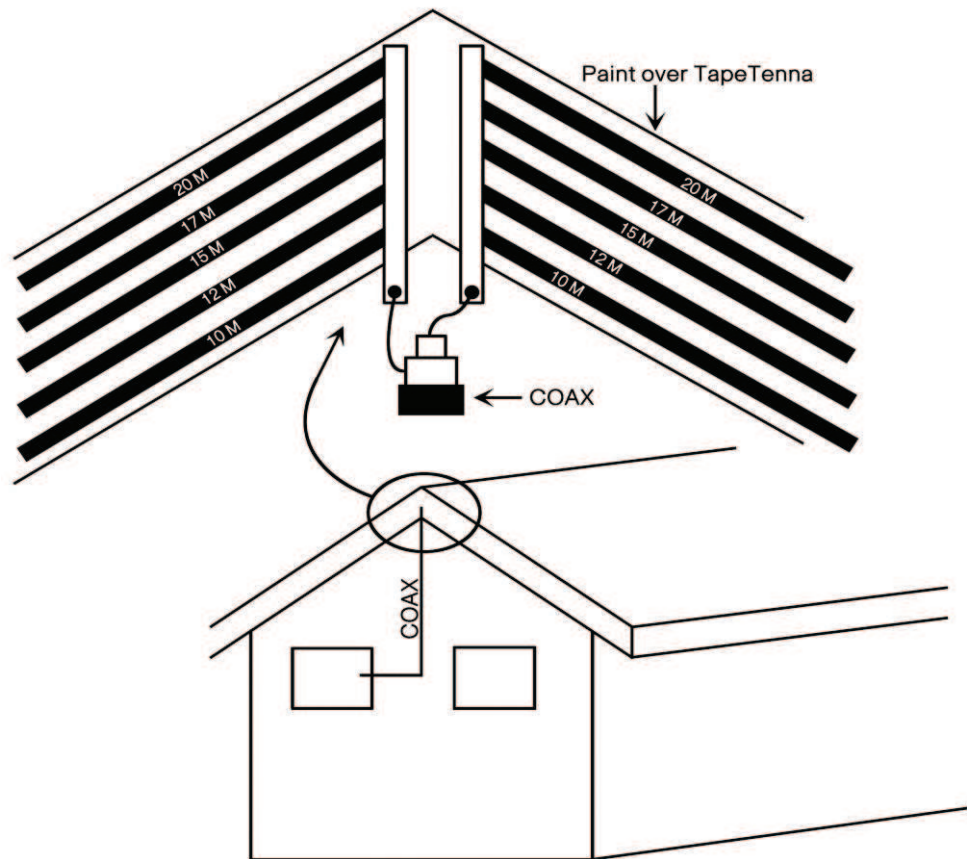
20m = 16.5'

17m = 13'

15m = 11'

12m = 9'

10m = 8.3'



#2 – 2 meter or 70 cm

J-pole

Type: J-pole

Bands: 2m or 70cm

Antenna tuner not required

Feed line: 52 ohm coax

Dimensions are for 2m.

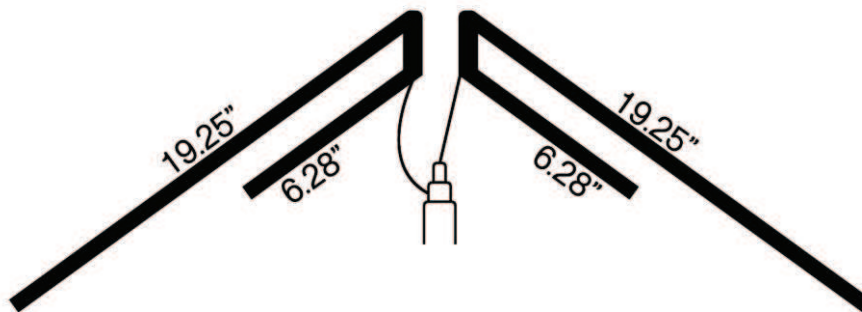
Multiply dimensions by .33 for 70 cm.

Tip: For portable operation, try sticking this design on paper sheets, fold the paper and place it in a manila folder for your brief case!

#3 – Mobile Dual Bander

Type: Inverted Vee, in the rear window of your vehicle. {the larger the back window the better – centre it.}

Bands: 2m or 70cm. Feed line: 52 ohm coax.



#4 – 8 Band HF Vertical

Type: Vertical

Bands: 10m through 80m

Feed line: TapeTenna - Antenna tuner required.

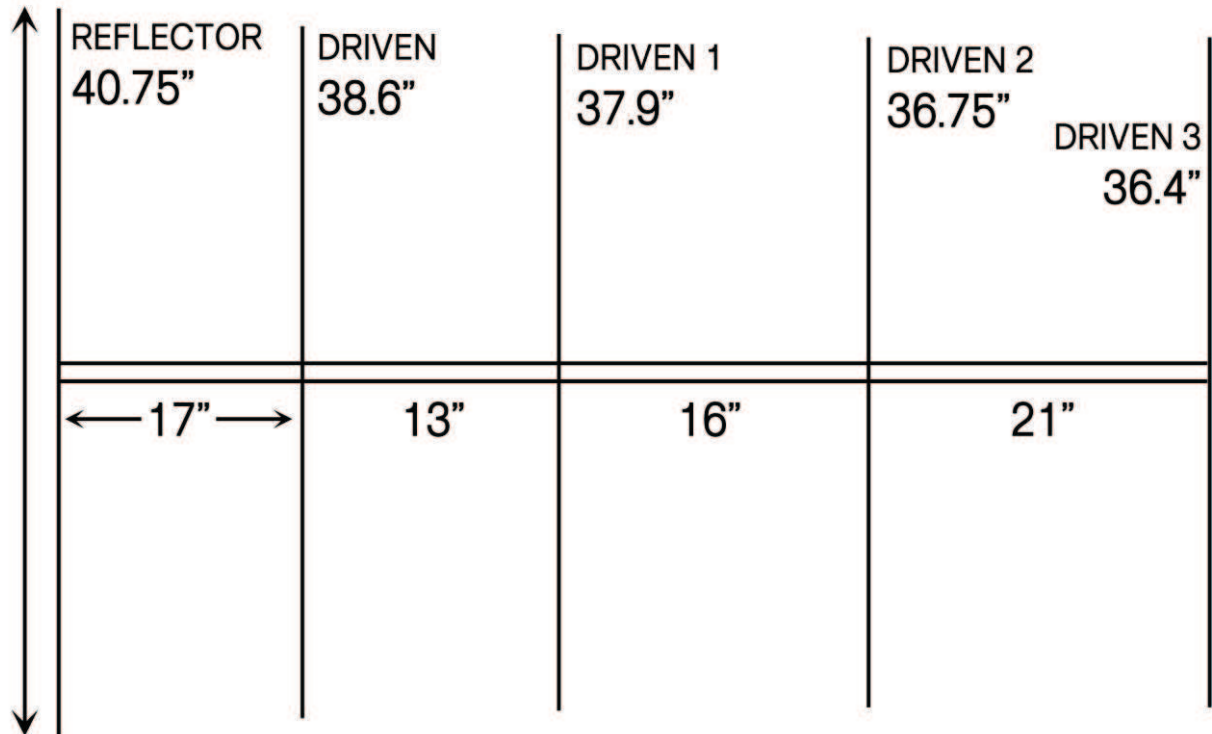
#5 – 2 Meter Wooden Yagi

Type: Yagi

Bands: 2m (centre at 146 MHz.)

Feed line: 52 ohm coax - Gamma Match required.

Paint for weather protection.



Boom: 1" x 1" wood

All elements are wood with TapeTenna continuous. Driven not continuous.

No electrical connection between elements.

#6 – Limited Space Multi-band Dipoles

Type: Dipole

Bands: 10m through 160m

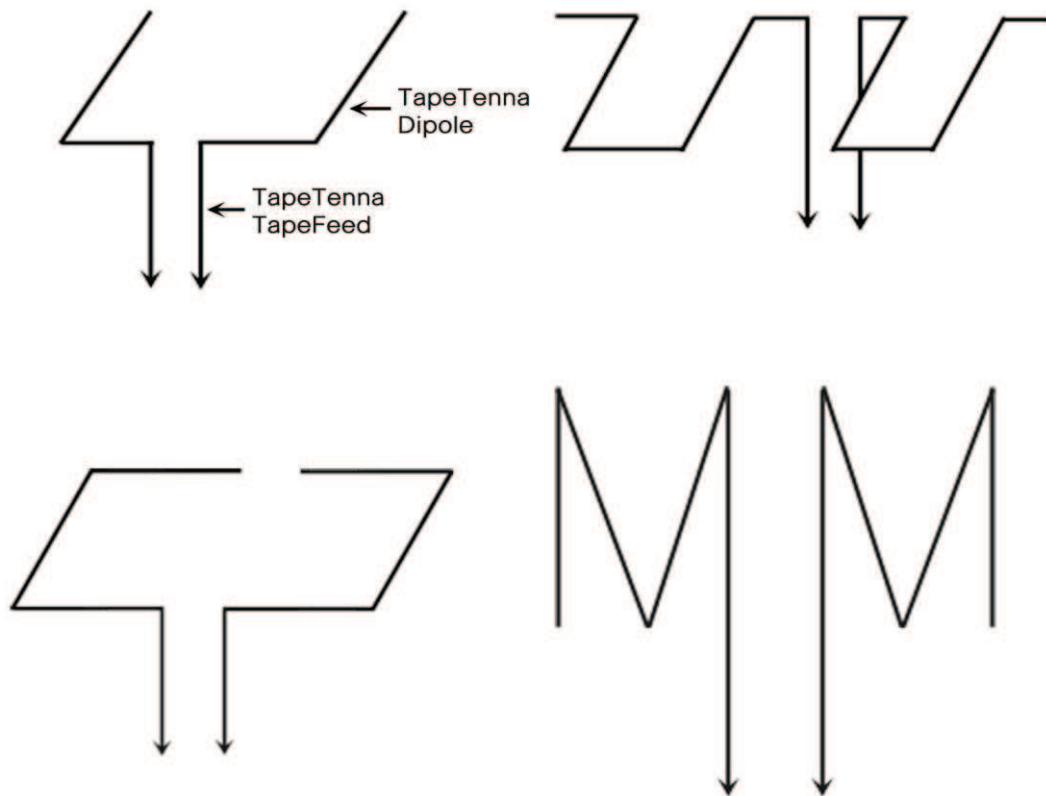
Feed line: TapeTenna tape used as feed line or coax

Apply any of the following 4 sketches, or any variation thereof, to the space that is available to you, whether attic, roof, or ceiling! Use more than one room for extra ceiling space.

Make the overall length of the dipole at least a half wavelength for the lowest frequency which you intend to operate:

<u>BAND</u>	<u>MINIMUM</u>	<u>BAND</u>	<u>MINIMUM</u>
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160m	246'	17m	25'
80m	125'	15m	22'
40m	66'	12m	18'
30m	47'	10m	17'
20m	33'		



*This technique may be used on the roof of a fibreglass motor home.

#7 – Be Creative

The best suggestion that I can offer is to ask you to be creative in using Copper Tape. Search antenna books and articles and apply the principles to your own situation.

Try your new antenna designs out at the.....

